

**A BIPOLAR TRANSISTOR HAVING LOW EXTRINSIC BASE RESISTANCE**

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H01L29/02; H01L29/66; (IPC1-7): H01L21/331;  
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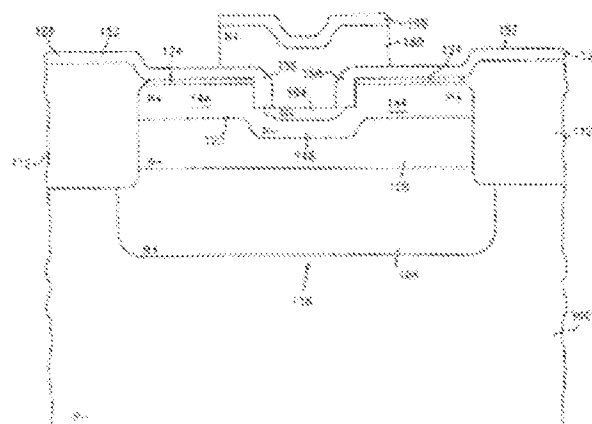
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Cited documents:

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JP64002361  
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A method is disclosed for forming a vertical bipolar transistor having a relatively low value of extrinsic base resistance. The method creates the transistor having a recessed emitter and a single polysilicon layer that functions as the emitter contact. The polysilicon emitter contact extends downward into a shallow trench formed in an upper portion of a layer of silicon that is heavily doped to form the extrinsic base regions on each side of the shallow trench. At the bottom of the shallow trench is the single crystal emitter region which overlies the intrinsic base region of the transistor. In turn, the intrinsic base region overlies the collector region.



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